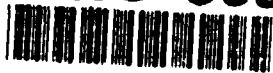


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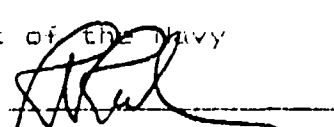
by

Richard M. Reed

Major, USMC

A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Operations.

The contents of this paper reflect my own personal views and not necessarily endorsed by the Naval War College or the Department of the Navy

Signature: 

11 February 1991

Paper directed by

Theodore W. Galchell, Colonel, U.S. Marine Corps

Operations Department Chairman

91 6 6 085

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED		1b. RESTRICTIVE MARKINGS	
2a. SECURITY CLASSIFICATION AUTHORITY		3. DISTRIBUTION/AVAILABILITY OF REPORT DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.	
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE		5. MONITORING ORGANIZATION REPORT NUMBER(S)	
4. PERFORMING ORGANIZATION REPORT NUMBER(S)		7a. NAME OF MONITORING ORGANIZATION	
6a. NAME OF PERFORMING ORGANIZATION OPERATIONS DEPARTMENT	6b. OFFICE SYMBOL (If applicable) C	7b. ADDRESS (City, State, and ZIP Code)	
8a. NAME OF FUNDING/SPONSORING ORGANIZATION		9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER	
8b. ADDRESS (City, State, and ZIP Code)		10. SOURCE OF FUNDING NUMBERS	
		PROGRAM ELEMENT NO.	PROJECT NO.
		TASK NO.	WORK UNIT ACCESSION NO.
11. TITLE (Include Security Classification) LOGISTICS - BODY OF THE BEAST (U)			
12. PERSONAL AUTHOR(S) MAJOR RICHARD M. REED, USMC			
13a. TYPE OF REPORT FINAL	13b. TIME COVERED FROM TO	14. DATE OF REPORT (Year, Month, Day) 2/11/91	15. PAGE COUNT 30
16. SUPPLEMENTARY NOTATION A paper submitted to the faculty of the Naval War College in partial satisfaction of the requirements of the Department of Operations. The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.			
17. COSATI CODES		18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)	
FIELD	GROUP	SUB-GROUP	
		Logistics; Campaigns; Operations; Historic Lessons; Impact	
19. ABSTRACT (Continue on reverse if necessary and identify by block number) This paper is a study of the impact of logistics on war. Two historical campaigns, Napoleon's Russian Campaign and the Normandy Invasion, are reviewed to determine if and how logistics contributed to the success or failure of the Grand Army and the Allies. In conclusion, an attempt is made to identify the logistic lessons that these historic campaigns provide. A comparison is made with current operations, Operation Desert Shield, to determine if the historic logistic lessons are applicable. Finally, an attempt is made to determine if and how logistics will impact upon future operations.			
20. DISTRIBUTION/AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS		21. ABSTRACT SECURITY CLASSIFICATION UNCLASSIFIED	
22a. NAME OF RESPONSIBLE INDIVIDUAL Chairman, Operations Department		22b. TELEPHONE (Include Area Code) 841-3414	22c. OFFICE SYMBOL C

DO FORM 1473, 84 MAR

83 APR edition may be used until exhausted.

All other editions are obsolete

SECURITY CLASSIFICATION OF THIS PAGE

U.S. Government Printing Office: 1989-039-012

0102-LF-014-6602

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Logistics - Body of the Beast

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CHAPTER I

INTRODUCTION

A review of the military literature reveals that there are endless volumes of material devoted to examining the strategy of warring nations and the tactics used by their commanders. Campaigns and battles have been described in limitless detail in an effort to pinpoint the factors which contributed to victory or defeat. While the art of logistics is usually taken for granted by arm chair theorist, operational commanders realize that its significance can not be ignored.

Armies must either be marched or transported to the battlefield. Men, camels, mules and horses must either be fed or left to their own devices. Wagons, cannons, tanks and aircraft must be maintained, repaired when required, and quickly returned to service. The limited quantities of arrows, musket balls and missiles, requires that they be carefully allocated, prudently expended, and rapidly re-supplied. While the wounded must either be cared for or left to die.

Strategy and tactics provide the scheme for the conduct of

military operations; logistics provides the means therefor. (1)
According to Rear Admiral Henry E. Eccles, "Logistics deal with the creation and sustained support of combat forces and weapons."

The history of warfare reveals that many critical strategic and tactical decisions have been based upon the logistic requirements or constraints of the combatants.

As early as 500 B.C., the renowned Chinese military leader and strategist, Sun Tzu, referred to the strategic and tactical significance of logistics in the oldest military treatise known, 'The Art of War'. The writings of Sun Tzu have had a profound influence throughout Chinese history and on Japanese military thought; it is the source of Mao Tse-Tung's strategic theories and of the tactical doctrine for the Chinese armies. (2)

The march of Hannibal's army, 38,000 foot soldiers, 8,000 horsemen and elephants from Spain through France and over the Alps into Italy in 218 B.C. was one of the boldest strategic attacks of all time. (3) Without any lines of communications back to his homeland, Hannibal completed this 1,500 mile expedition by carefully planning his army's logistic support. Hannibal went to great lengths to ensure that his strategic aims were logistically achievable.

Alexander the Great based his strategy and tactics upon logistics. (4) Alexander prearranged his army's support prior to any deployment. In the Middle East regions where supplies

() could not be secured in advance, he would not venture forward until the areas resources had been determined. He would then strike with a small contingent while leaving the main body of his army at a well supplied base in the rear. In contrast to his Greek and Persian counterparts, Alexander required his soldiers to carry their armor along with some provisions and barred the use of baggage carts.

The restricted use of carts not only increased the army's mobility in rough terrain but also reduced the number of drivers and the need to carry replacement parts and lumber for repairs--an important consideration in the treeless areas of the middle east. (5) By shorting the proverbial "logistics tail", the Macedonian army was the lightest and most mobile force of the period.

The Romans were also aware of the importance of logistics.

"The well-planned and constructed roads of ancient Rome may well have served commerce, but their chief purpose was to provide an unmatched mobility for Roman legions and their logistical support. Roman military commanders seem to have understood well that logistics is the bridge between a nation's combat troops and its industry and natural resources". (6)

() In the 13th century, the Mongolian army was the best army in the world. (7) Chinggis Khan's Mongols raced across Eurasia demonstrating the fundamentals of maneuver warfare along with its required logistics support. The Mongols planned routes and

campsites, they traveled with large trains of wagons, horses, pack animals, and cattle, supported by a network of grain stores.(8)

In contrast, Napoleon combined several of the earlier methods into a logistic system tailored for the Grand Army. Napoleon devoted an significant amount of time to his army's logistics. However, it was the Emperor's chief of staff, General Antoine Henri Jomini, who documented and advanced the strategic and tactical importance of logistics. Jomini defined the "Art of War" as the division of five purely military branches: strategy, grand tactics, logistics, engineering and elementary tactics.(9) According to Jomini, logistics comprised the means and arrangements which worked out the plans of strategy and tactics.(10) Jomini indicated that a disregard to strategy, tactics and logistics has often meant the difference between success and failure.(11)

Ironically, Napoleon's reluctance to acknowledge and reestablish a balance between his strategic aims and his army's logistic capabilities which formed the basis for his disastrous defeat in Russia.

CHAPTER II

NAPOLEONIC LOGISTICS AND THE RUSSIAN CAMPAIGN

Moscow

The Russian invasion began on the early morning of June 24, 1812 as Napoleon's Grand Army crossed the Nieman river near the city of Kovno.

Figures of the Grand Army's strength vary sharply from one account to another, ranging from 430,000 to 610,000; but it seems likely that about 530,000 troops crossed the Niemen, with more than a thousand field pieces, some 30,000 carts and wagons, over 150,000 horses and several thousand officials and grooms.(1) In contrast, the Russians assembled fewer than half as many men and field pieces.

Accustomed to making all of the decisions, Napoleon invested an enormous effort in assembling all of the supplies, horses, wagons, ammunition and other material required for the campaign. As stated in one of Napoleon's planning documents:

"I propose having 2016 carts, 4 battalions totaling 2424 carriages, 4 battalions of ox teams making 1224 carts, one battalion of ox teams from the Kingdom of Italy with 306 carts; grand total 17 battalions with close on 6000

vehicles, and carrying 5500 to 6000 tons, equal to one million rations of flour, or enough to supply an army of 200,000 men for two months." (2)

Napoleon established three advanced storage site for supplies at Dantzig, Magdeburg and Maintz. His intent was to lead his army into the Russian interior being able to feed his men from their stores and the organic resources of the Russian countryside. In spite of these preparations, the very out set of the campaign revealed the shortcomings of the emperor's logistics plan.

Napoleon was convinced that the Russians would defend their homeland. As a result, his strategic aim was to defeat the Russian army in a decisive battle and thereby force the Czar to accept his terms for peace.

The Russians, being acutely aware of Napoleon's military prowess and the numerical superiority of the Grand Army, conducted a strategic withdraw while destroying all resources which could be used by their adversaries.

"If the enemy pursues us, he will perish, because the farther he proceeds from his stores of provisions, his arms and munition depots, the farther he penetrates a land without passable roads or provisions that he can seize, the more pitiful will be his condition. He will be surrounded by a army of Cossacks and in the end will be destroyed by our winter, which has always been our loyal ally." (3)

Napoleon's dominance on the battlefield was due in large

part to his ability mass and maneuver his forces. Mobility was a critical element to the Grand Army as it pressed for the decisive battle and victory. The army's calvary, artillery, and supply trains all depended upon horses for their success. Without question, horses, were an essential vulnerability, which had to be protected with proper care and feeding.

After crossing the Nieman, Napoleon immediately marched, approximately 50 miles, from Kovno to Wilna in sweltering heat and thunderstorms in hopes of engaging the Russian army in a decisive battle. But, the weather took its toll on the Grand Army. Wagons which were designed for hard surfaced roads not muddy Russian trails were slowed to a crawl, as men died of sunstroke. Russian bridges collapsed under the weight of field pieces and supply wagons.

Horses which were so vital to the campaign, were primarily fed green forage and only occasionally received a small ration of oats or barley.(4) Almost immediately, tens of thousand of horses were seized by a epidemic of colic and within ten days 10,000 horses were dead.(5) One officer counted 1,240 dead horses within the space of five leagues between Kovno and Vilna.(6)

As one could imagine, the loss of horses had a ripple effect upon the Grand Army's efficiency which it never recovered from. Many calvary men, unaccustomed to marching, were reduced to foot soldiers. Men, field pieces and supply trains, loaded with provisions, were stopped in their tracks or

straggled far behind the main army. At every march hunger, diarrhea, and dysentery laid men low. (7) The Grand Army had seized Kovno and Vilna with only token Russian resistance, but the casualties from the lack of logistics were staggering. Many men lacking food, were beginning to eat the horses that died beside the road. (8)

Still seeking the decisive battle, Napoleon continued to march eastward to Vitebsk further straining his already tenuous lines of communication.

"...The enumerable wagons, the enormous quantity of supplies of all sorts that had been collected at such expense during the course of two years, had vanished through theft and loss, or through lack of means to bring them up. They were scattered all along the roads. The rapidity of the forced march, the shortage of harness and spare parts, the dearth of provisions, the want of care, all had helped to kill horses...We had not fought a battle, and there was not even any lint." (9)

From Vitebsk, the Grand Army's lines of communication were stretched more than 250 miles and its impact was apparent.

Jomini described the situation:

"My troops had suffered much from the bad weather during their march from the Niemen to the Dwina...Our scanty supplies and coarse food had propagated disease among the soldiers; our magazines were still on their way from Königsburg to Kovno... The soldiers were obliged to subsist on boiled rye which produced horrible dysenteries." (10)

Napoleon departed Vitebsk during the middle of August, once again, in an attempt to engage the Russian army at

Smolensk. With the exception of a clash with the enemy's rear party, in which the Grand Army incurred 12,000 casualties with limited medical services, the Russians continued to evade battle. The city of Smolensk was left ablaze as the Russians withdrew.

Yet, another attempt to destroy the Russians in battle failed to produce any significant results. The Grand Army had entered another city that had been stripped of all its resources. Napoleon's logistic deficiencies loomed larger as three attempts to pin down the Russian army had practically exhausted his army and not brought him any closer to his strategic aims. The Emperor aware of his army's distress noted:

"My heart felt oppressed when I reflected upon...my army which sickness and want had already diminished by one-third." (11)

Napoleon certain that the Russians would never allow their capital to fall to the invaders, again pressed the advance. From Moscow the Grand Army's supply lines now stretched back across the Russian plain for more than 500 miles. Napoleon entered Moscow in mid September and took up residence in the Kremlin. For over a month Napoleon attempted to entice the Czar in to negotiating a treaty on his terms. The soldiers of the Grand Army were practically destitute and lived from hand to mouth amidst the devastation left by the Russian army.

Unable to persuade the Czar to capitulate, the order was given to retreat. The troops were so undisciplined that they

filled the remaining wagons with piles of booty instead the meager provisions they could scrape together. The surviving horses were so weak and under nourished that many died of exhaustion only few miles outside of the city.

When the Russian winter struck the Grand Army almost came to a halt.

"So inadequate had the army's administration been, that none of the horses had been shod for ice. Many, falling on the ice, could not get up again because of their smooth shoes, and so froze as they lay. And of these most were eaten, many even falling prey to the knives of half-starved men while still the last flickering signs of life remained. Nor were the horses alone being eaten. Cannibalism-hidden, secret, horrible-was becoming frequent. Many a frozen corpse gave up its garments and then some portion of its flesh..."(12)

The importance of logistics was revealed throughout the Russian campaign. The Grand army which had crossed the Nieman a half a million strong, had been reduced to ragged, starving, frozen, mass, in less than six months, without ever engaging in a major battle.

The immense logistic requirements of an army must be thoroughly planned and far exceed the abilities of one individual, even the military genius of Napoleon. The emperor immersed in strategic and tactical details, could not realistically coordinate the logistical complexities of a major campaign. This campaign illustrates the interwoven relationship that exist between strategy, tactics and logistics

is evident. Napoleon's strategic aims far exceeded his army's logistic capabilities. This imbalance contributed to the most disastrous failures of one of the greatest military leader of modern times.

CHAPTER III

LOGISTICS AND THE NORMANDY INVASION

In many respects World War II was a logistician's war. (1) In determining which enemy to defeat first, Germany or Japan, U.S. strategist had to weigh several logistic factors. First, the limited resources required the U.S. to choose between theaters of emphasis. Secondly, the lines of communications (LOC) were shorter to the European theater. Finally, U.S. strategist had to estimate the time required to rebuild our naval forces in the Pacific theater for sustained operations. After considering these issues and others, not to mention the political ramifications, the U.S. decided on a "Europe first" strategy.

"Our strategy, in general, was to hold the enemy at bay while gathering our strength for offensive action and then, because we were unable, either from the standpoint of human or material logistics, to attack both at once, to give priority to the destruction of the most formidable-Germany. The holding phase of our strategy included the provision of all possible material logistic assistance to our Allies, the securing of lines of communication, and a preliminary offensive against the enemy's

logistic potential by bombing his industrial plant, disrupting his lines of communications, and depriving him of raw materials. The second phase of our strategy was implemented only when our men were trained and we were able to bring to bear preponderant weight in material." (2)

The Normandy invasion, represented the largest movement of U.S. forces in the European theater. In development of the plans for the great invasion, logistics dominated the objectives, the choice of landing sites, the size of the assault force, and plans for building up the initial forces and pushing in land. (3)

The landing convoy consisted of over 5,000 ships while the first wave carried more than 125,000 U.S. troops along with their equipment. By D plus 90 the Allied force was expanded to well over 1,000,000 men. In order to facilitate the off load of cargo and its subsequent shuttle ashore, artificial harbors had to be towed across the channel. Although these harbors facilitated the rapid off load and turn around of ships some problems developed in maintaining a record of each ship's cargo and priority of unloading. Even with this problem, the logistic plans and beachhead staging proved to be more than adequate. By D plus 24 over 70,000 vehicles and more than 275,000 tons of supplies had be moved ashore.

As the life blood of modern forces, petroleum, oil and lubricants (POL) were emphasized in the plans and accounted for about 25 percent of the tonnage moved across the beachhead.

The Allies thorough planning was evident during the early stages of their invasion into Europe. Supplies were reaching the beaches in sufficient quantities and were being moved forward expeditiously. The initial strategy for the invasion was to capture the ports in western France and then continue north to the port of Antwerp. These ports were considered essential for off loading troops and equipment.

However, the unexpected tactical breakthrough at St Lo, which was a deviation from the original strategic plan, was followed in favor of a pursuit to quickly destroy the German army. The Allied Armies in seizing the initiative and maintaining the momentum went well beyond their initial objectives.

The advancing Allied columns reached the Seine only eleven days ahead of schedule, but in the proceeding thirty days they had covered a distance expected to take seventy days.(4) The emphasis that had been placed on the build up the beachhead was now shifted towards keeping pace with the army's advance. By D plus 90 when it was planned that they should be close to the Seine, spearheads of the Third Army were 200 miles beyond.(5) This advance constituted a major change in strategy and logistics. In order to appreciate the supply effort, the Supreme Commander noted:

" The services of supply had made a heroic and effective effort to keep us going to the last minute. They installed systems of truck transport by taking over the main road routes in France and using most of these for one way

traffic. These were called Red Ball Highways, on which trucks kept running continuously. Every vehicle ran at least twenty four hours...

Railway engineers worked night and day to repair broken bridges and track and to restore the operational efficiency of rolling stock. Gasoline and fuel oil were brought onto the continent by means of flexible pipeline laid under the English Channel. From the beaches the gas and oil were pumped forward to main distribution points through pipelines laid on the surface of the ground." (6)

At peak strength the Red Ball Express consisted of 132 truck companies, with 5958 vehicles and hauled a one day record of 12,342 tons of supplies. (7) In spite of these types of accomplishments, the Red Ball Express effectiveness was hampered by the lack of control traffic, inadequate vehicle maintenance and driver exhaustion in an attempt to support the advance.

In terms of logistics preparation and the current state of the demoralized enemy, it appears that the allies should have been able to maintain the momentum of the pursuit indefinitely. It seems clear that time distance factors affected resupply efforts. The combination of the distance covered so quickly by the advance from Normancy, to the damage roads and railways and the increasing size of the army without a port facility close to the front all affected the advance. However, General Eisenhower realized that allies needed a port closer to the current front.

"The only operating ports were Cherbourg and

the artificial port on the British beaches near Arromanches...Our spearheads... advance doubled the difficulty because the supply trucks had to make a two way run to the beaches and back...These meager facilities could not support us indefinitely and there was bound to be a line somewhere in the direction of Germany where we would be halted..."(8)

In less than three months, the Red Ball Express could not continue to maintain the pace of the advance. Finally, even with all the logistic planning and effort expended by the Red Ball Express the allied advance ground to a halt.

"On the sunny afternoon of September 13, tanks from the 3rd Armored Division of the VII Corps broke across the German border..."

But the news of this border crossing could not hide the fact that at last we had run out of momentum, for no sooner had our troops crossed the frontier than we jarred to a sudden halt. For the next two months we were to wait on the Siegfried Line until the long supply line that reached back to Cherbourg was replaced by another at Antwerp."(9)

Since there was not enough gas to support the advance, the forward units of the Third Army had to clean their equipment for almost two weeks just to occupy themselves. These logistic limitations led to a major strategic decision by General Eisenhower to develop a broad front offense which was much slower than the single thrust of the Third Army. This strategy enabled the logistic forces to catch up and sustain the advance.

Operation Overlord and the Allied breakout is a fitting

example of the bond which exist between strategy, tactics and logistics. The unexpected sprint of the Third Army extended to the LOC to their culminating point. The 'broad front' offense restored logistic balance and assisted the Allies in achieving their strategic objective.

CHAPTER IV

CONCLUSION

There are several vital lessons to be derived from these historic campaigns. First, strategy, tactics and logistics are inseparable concepts. Napoleon's Russian campaign and the Normandy invasion clearly illustrate the interdependence of strategy and logistics. Napoleon's defeat was attributed to his flawed strategic and logistic concepts. While the Allies ability to achieve their war objectives can be attributed to the Supreme Commander's skill in coordinating their strategic aims with their logistic capabilities and thus, maintain a unity of effort.

Secondly, campaigns must be comprehensive. Both of these campaigns demonstrate the logistics limits that are imposed upon strategic and tactical concepts. As a result, strategic and tactical plans which lack comprehensiveness, by disregarding logistic factors, are begging disasters.

Operational commanders must translate strategic guidance

into comprehensive campaign plans. While operational planning concentrates on the design and execution of a campaign, the sustainment of combat forces is fundamental to success. A campaign plan that cannot be logistically supported is not a plan at all, but simply an extension of fanciful words.(1)

According to FM 100-5: Reduced to essentials, operational art requires the commander to answer three questions.

(1) What military conditions must be produced in the theater of war or operations to achieve the strategic goal?

(2) What sequence of actions is most likely to produce that condition?

(3) How should the resources on the force be applied to accomplish that sequence of actions?

In establishing conditions for success, operational commanders must view their strategic goals in relation to their logistic capabilities. Campaigns will often be limited in their design and execution by their support structure and resources of a theater of war.(2)

The idea of sequencing applies to resources as well as actions.(3) Resources must be available at the right place, at the right time, and in sufficient quantities to sustain combat forces. Sequencing allows us to allocate resources effectively over time.(4)

The objective of all logistics effort must be the attainment of sustained combat effectiveness in operating

forces.(5) In this regard, logistic support must be flexible and responsive: able to adjust to the fluid environment and uncertainties which exit in the "fog of war".

Current Operations. The massive deployment of U.S. troops and equipment to Saudi Arabia in support of Operation Desert Shield illustrates the continuing relationship that exist between strategy and logistics.

A rapid and robust logistics build up was required to support strategic aims in the region and proceed combat (tactical) operations.

(1) Pre-positioned material was moved to the area of conflict. I.E., USMC Maritime Pre-positioned Ships (MPS), USN hospital, USAF bare base, hospitals.

(2) Theater infastructure and host nation support had to be determined then and augment where required. I.E., Ports, airfields, supply depots, maintenance and support facilities for over 500,000 troops, 100 ships and 1000 aircraft. Six billion pounds of supplies were shipped 8,000 miles from the U.S. in the first 30 days of the deployment.

(3) Theater reserves stocks had to be established to ensure sustained operations. I.E., Subsistence, POL, and Munitions

While the desert is the ideal environment for maneuver warfare, it presents numerous logistics challenges. It is estimated that maneuver elements will consume almost 1 million gallons of fuel per day in the early stages of a ground campaign. This is more than three times the amount of fuel consumed by the Third Army in its pursuit across Europe.

A disruption in the flow of fuel, munitions, provisions, repair parts and medical supplies can have a dramatic effect upon ground, naval and air forces.

Rear Admiral Eccles described the importance of logistics on war as follows: "The old analogy of the Beast of War being a body of fighting power with a tail of logistics is merely a worn out romantic cliché based on ignorance of the facts of war. It would be more correct to say that the Beast of War has the teeth and claws of weapons; body, bone and muscle of logistics..."

Logistics is the body of the Beast.

When the current war has ended, troops, equipment, aircraft and ships will have to be redeployed. Theater depots will have to be evacuated and returned to the Saudi government. Battle damaged equipment will have to be recovered for disposal or salvage. Pre-positioned equipment will have to be recovered, repaired, preserved then returned to storage for

deployment to the next area of conflict.

Prospects for the future. It is difficult to imagine that the role of logistic will diminish in the future. As the defense budget dwindles, the number of weapons systems will be reduced as they become more sophisticated. This loss in redundancy will make the maintenance of fielded and pre-positioned equipment, weapon systems and platforms even more critical to our national defense.

Even as our force structure is reduced, our logistic requirements will remain unchanged. We must still be able to deploy rapidly. Attack if necessary and sustain that force, regardless of its size, until our strategic objectives are achieved.

According to Admiral Hyman Rickover, "Bitter experience in war has taught the maxim that the art of war is the art of logistically feasible."

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3. Fleet Marine Force Field Manual 1-1, Campaigning (Washington, January 1990), p. 46.

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